in origin, though careful dissections and vessel injections after death are few.[8] The vessel(s) involved are the sylvian branches of the posterior cerebral arteries supplying the posterior ventromedial quadrants of the temporal lobes. Lesions at that location do not interfere with propositional speech, hearing, reading, remote memory or visual fields nor, most remarkable, with highly developed technical skills or with the ability to recognize familiar faces (that is, *prosopagnosia*). Thus, Byer and Crowley[9] reported the case of an organist who was able to perform a recital flawlessly despite a coincident episode of transient global amnesia.

Apart from anxiety due to awareness of the deficit, patients with transient global amnesia do not have the characteristic symptoms of the Klüver-Bucy syndrome,[5] for example, psychic blindness, first described in 1938.[10] This syndrome has been reproduced in monkeys by bilateral temporal lobectomy or by destruction of one temporal lobe, of the contralateral occipital lobe, and cutting the splenium of the corpus callosum.

We suggest that if a clinician obtains a medical history characteristic of transient global amnesia in a patient, skull x-ray evaluation or cerebrospinal fluid examination is superfluous. The percentage of abnormal findings on radionuclide scans, angiograms and electroencephalograms varies greatly from patient series to series. A careful medical and neurologic examination supplemented by a CT scan and regular follow-up examinations can suffice to establish the diagnosis in most patients suspected of having transient global amnesia. Their gratitude (and the relief of their families) that they are probably not dealing with a progressive or threatened stroke or malignancy provides justification that a clinician be aware of this subtype of the far more common entity, transient ischemic attack with amaurosis fugax, or fleeting sensorimotor deficits.

Finally, the classically accepted role of the fornix-mamillary bodies of the hippocampus in the memory process is questioned on the basis of careful studies in a limited number of monkeys reported by Horel[5] in 1978. This theory correlates with the suggestion of Victor and associates[8] that damage to certain thalamic nuclei is responsible for the characteristic memory deficit in Korsakoff's (alcoholic) psychosis.

Mathew and Meyer[11] have emphasized that recurrent episodes of transient global amnesia (not seen in our smaller series) imply an increased risk of dementia with permanent loss of memory or what they term an "amnesic stroke" (that is, sensorimotor deficit developing in the setting of one or more amnesic attacks).

Summary

The cases of six middle-aged patients with characteristic symptoms of transient global amnesia have been followed. We emphasize the importance of recognizing this rather common clinical entity as benign (that is, unlikely in our experience either to recur or to evolve into a more characteristic hemiplegic stroke).

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Toothpick Perforation of the Inferior Vena Cava

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TOOTHPICK PERFORATION of the duodenum into the inferior vena cava is a medical curiosity. The following case, however, illustrates several points of general interest. First, when multiple Gram-negative organisms are cultured from the blood, an intraabdominal source of infection is likely to be present. Second, abdominal computerized tomographic (CT) scanning is an effective means of inspecting the retroperitoneum: it can detect small foci of infection that are not apparent on plain films of the abdomen and thus aid in diagnosing inferior vena caval thrombosis. Finally, suppurative thrombophlebitis is best treated by vein excision.

Report of a Case

A 45-year-old rancher was admitted to a Sacramento Valley (California) hospital because of fever, chills, weakness and abdominal pain for four days. Previously his health had been excellent, although he did say that he had been drinking half a bottle of scotch a day for many months. On admission, physical examination showed a confused middle-aged man with a temperature of 37.6°C (99.7°F). Aside from mild epigastric tenderness, physical findings were unremarkable. Admitting laboratory studies disclosed the following values: hematocrit, 47 percent; leukocyte count, 12,000 per μl with toxic granulations; albumin, 3.1 grams per dl; total bilirubin, 0.6 mg per dl; alkaline phosphatase, 138, serum aspartate aminotransferase (formerly SGOT), 83 and amylase, 203 IU per liter, and stool guaiac, trace positive.

Refer to: Allen B, Krupski WC, Wylie EJ: Toothpick perforation of the inferior vena cava. West J Med 1983 May; 138:727-730.

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A diagnosis of alcoholic pancreatitis was made and the patient was treated with nasogastric suction and fluids administered intravenously. On the third day of his hospital stay, the patient became febrile to 40°C (104°F) and broad-spectrum antibiotic therapy was started. Initial blood cultures were positive for group B *Streptococcus* but culture of a blood specimen drawn on the sixth hospital day, when the patient was receiving penicillin alone, grew *Escherichia hafnia*. Gentamicin therapy was reinstituted but, despite apparently adequate antibiotic coverage, the patient was persistently febrile and in a toxic condition during a nine-day hospital course. Analysis of urine, lumbar puncture, abdominal ultrasonogram, liver-spleen scan and upper gastrointestinal series showed no abnormalities. He was transferred to University of California, San Francisco, for further evaluation.

On admission, the patient's temperature was 39.8°C (103.6°F), pulse rate 125, blood pressure 95/55 mm of mercury and respirations 28 per minute. He was disoriented, but physical examination showed otherwise normal findings. Laboratory examination showed persistent leukocytosis and hyperamylasemia. In the ensuing week, there were daily temperature spikes to 40°C (104°F). Cultures of blood specimens drawn during antibiotic therapy grew five different organisms considered to be oral flora. They were identified as *Streptococcus intermedius, Eikenella corrodens, Bifidobacterium* sp, *Bacteroides melaninogenicus* and *Veillonella.* An abdominal CT scan done at the time of admission showed a diffusely enlarged pancreas without evidence of pancreatic abscess. A repeat abdominal CT scan on the ninth hospital day showed no change in the pancreas. However, additional views of the inferior vena cava were incidentally obtained. A low-density filling defect and air bubbles were seen in the infrarenal inferior vena cava (Figure 1). Based on these findings, a diagnosis of septic thrombosis of the inferior vena cava was made. Another chest x-ray film taken at this time showed multiple new pulmonary nodules, one of which showed central cavitation. A phlebogram of the inferior vena cava confirmed the presence of thrombus in the vena cava (Figure 2).

At operation the pancreas was firm and diffusely enlarged. The duodenum was densely adherent to the underlying vena cava. The remainder of the abdominal exploration gave normal findings. The vena cava was then resected from the iliac veins inferiorly to the renal vein superiorly. A toothpick was found in the distal portion of the specimen, surrounded by thrombus and extending into the left common iliac vein (Figure 3). Careful inspection of the reflected duodenum revealed a 2-mm perforation.

The iliac veins and vena cava were then oversewn

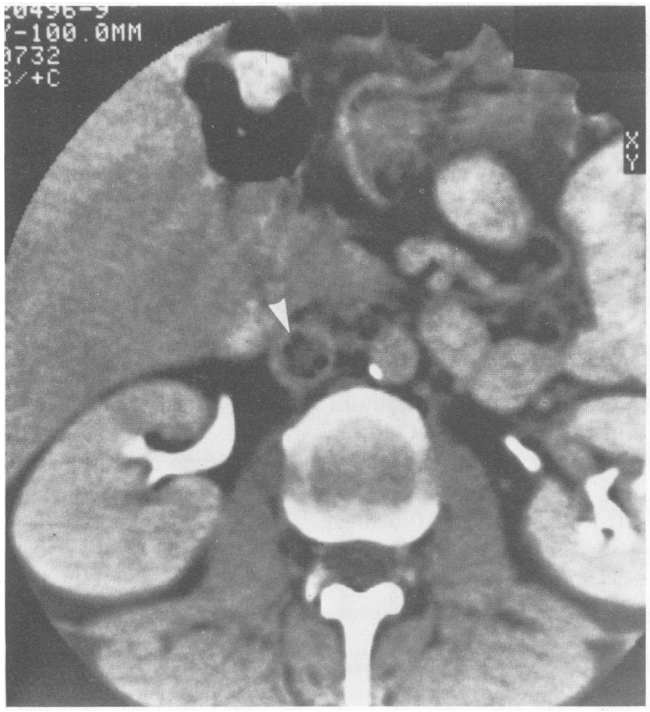

Figure 1.—A computerized tomographic scan of the mid-abdomen. The arrow points to the thrombus and the air bubbles in the inferior vena cava.

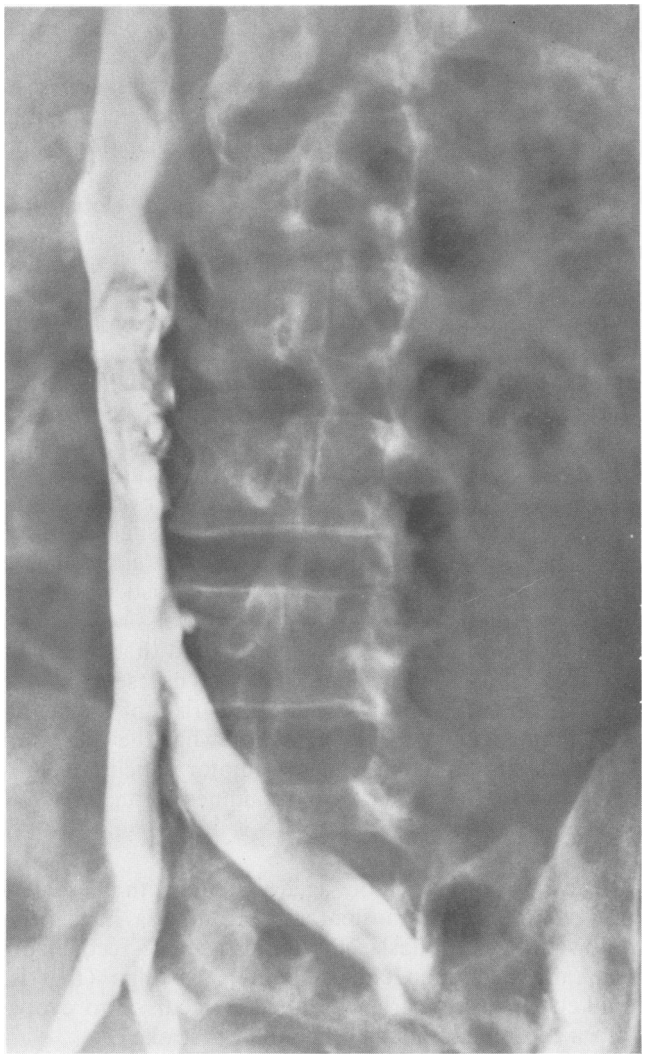

Figure 2.—An inferior vena cavogram confirming the presence of a thrombus.

with polypropylene sutures and the duodenum was repaired in two layers. Postoperative recovery was smooth. Antibiotic administration was continued for ten days and the patient promptly became afebrile. Chest films showed clearing of the pulmonary nodules.

The patient was discharged two weeks postoperatively and was doing well two months after discharge, with no venous insufficiency of the lower extremities. When questioned later, he recalled occasionally eating club sandwiches and hors d'oeuvres containing toothpicks, but did not remember swallowing a toothpick. He does not wear dentures but does admit to binge drinking.

Comments

Two previous cases of toothpick perforation through the duodenum into the vena cava have been reported.[1,2] In each instance, a one- to two-week history of abdominal symptoms, fever and chills preceded admission to hospital. Florid sepsis was evident at the time of admission, and blood cultures grew multiple organisms. Both patients died of overwhelming sepsis and at postmortem examination were found to have toothpicks lodged within a fistula between the duodenum and inferior vena cava.

Two other cases were similar to ours. A toothpick was discovered in the right ventricle during tricuspid valve replacement and pulmonary embolectomy in a patient who presented with *Candida* endocarditis and septic pulmonary emboli.[3] This man died of irreversible pulmonary hypertension and at postmortem examination had fibrous scarring and evidence of old hemorrhage near the duodenal-caval interface. Another patient died of streptococcal septicemia following fishbone perforation of the portal vein.[4]

Figure 3.—Resected segment of inferior vena cava with toothpick extending from intraluminal thrombus.

These cases show the great difficulty of making a premortem diagnosis of toothpick perforation of the gastrointestinal tract.[5] Generally, patients cannot recall toothpick ingestion even if subsequently they admit to their use. Unlike other foreign bodies, such as metal objects and bones, toothpicks are not detected by standard x-ray studies. Perforation may occur into the retroperitoneum, and normal inflammatory responses may seal the injury. Free peritoneal air is seldom seen.[6]

Previous reviews have shown that ingestion of foreign bodies tends to occur in patients whose oral sensation is diminished because of excessive alcohol ingestion or the use of dentures.[5,7,8] Although about 80 percent of foreign bodies pass in the feces, sharp objects may arrest and perforate anywhere along the gastrointestinal tract. Points of angulation that may cause delay in passage of a foreign body include the junction of the second and third parts of the duodenum, the ileocecal valve, the appendix and the flexures and haustra of the large intestine.[9] Perforation of the upper gastrointestinal tract, which occurred in our patient, is a rare presentation. In one large series of intestinal perforations due to sharp foreign bodies, only 5 of 83 perforations occurred in the region of the stomach or duodenum, whereas 73 percent occurred in the ileocecal region.[10]

Computerized tomography recently has been found capable of detecting tumor invasion and thrombosis of the great vessels in the retroperitoneum. CT scans have correctly visualized renal, adrenal and testicular tumor extension into the renal veins and inferior vena cava, and thrombus has been shown below the level of an inferior vena cava umbrella placed for recurrent pulmonary emboli.[11,12] Indirect evidence of thrombosis may be seen as enlargement of the renal veins or inferior vena cava, whereas direct evidence may be obtained by CT scanning after a bolus injection of water-soluble contrast through a peripheral vein.[6] The incidence of false-positive or false-negative studies in these situations, however, is unknown. Computerized tomography remains a useful adjunct to traditional phlebography, providing noninvasive evaluation of the retroperitoneum.

In addition to the detection of thrombus, computerized tomography permitted the specific diagnosis of *septic* thrombosis of the inferior vena cava in our patient. The finding of intraluminal gas pockets was first described in four patients with infected Dacron aortofemoral bypass grafts.[13] In these cases and in one other case of subcutaneous emphysema of the leg due to toothpick perforation of the ileum,[14] gas may have been produced by bacteria or pushed into the retroperitoneum by gut peristalsis.

Septic thrombosis of central veins has been uncommon in the past but has occurred more frequently since

the advent of central venous catheters. Suppurative thrombophlebitis of the peripheral veins is most efficiently treated by excision of the involved segment.[15,16] Less accessible central veins have been treated with administration of antibiotics and anticoagulation.[17] Although experience is limited, septic pulmonary emboli or sepsis refractory to antibiotic therapy is the present indication for surgical intervention in suppurative central venous thrombosis. Excision of the infrarenal vena cava was well tolerated by our patient. Abundant collateral pathways through the left gonadal, the azygous and the inferior epigastric veins often prevent the development of lower extremity venous insufficiency.

Both new and traditional diagnostic methods led to a correct diagnosis of septic thrombosis of the inferior vena cava in our patient, and an aggressive surgical approach resulted in a rapid, dramatic cure with no significant morbidity. We believe this is the first successful treatment of this rare disorder.

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